



HOUSTON FIRE DEPARTMENT LIFE SAFETY BUREAU (LSB)



LSB STANDARD 03, REV 03 FIRE DEPARTMENT ACCESS

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LSB STANDARD 03, Rev 03
FIRE DEPARTMENT ACCESS

CONTENTS

SECTION 3.1 --- GENERAL	7
3.1.1 Scope.....	7
3.1.2 Purpose.....	7
SECTION 3.2 --- DEFINITIONS.....	8
3.2.1 Access Control Gate or Barrier.	8
3.2.2 Cul-de-sac.....	8
3.2.3 Dead Ends.	8
3.2.4 Fire Apparatus Access Road.	8
3.2.5 Fire Lane.....	9
3.2.6 Private Drive.....	9
3.2.7 Private Street or road.	9
3.2.8 Public Street.....	10
SECTION 3.3 --- GENERAL REQUIREMENTS.....	10
3.3.1 Where Required.....	10
3.3.2 Permits required.....	11
3.3.3 Plans.....	12
3.3.3.1 Plans for access roads and control gates.....	12
3.3.3.2 Plans for private fire hydrant systems.	12
3.3.3.3 Timing of installation.....	12
3.3.3.4 Access to building openings.....	12
3.3.3.5 High Piled Storage Facilities.....	13
3.3.4 Required Marking of Fire Apparatus Access Roads, Fire Lanes, Addresses and Fire-Protection Equipment.	13
3.3.4.1 General.....	13
3.3.4.2 Signs and Notices.	13
3.3.4.3 Marking of fire-protection equipment and fire hydrants.....	13
3.3.4.4 Removal of required signs, gates or barriers.....	14
SECTION 3.4 --- FIRE APPARATUS ACCESS ROADS AND FIRE LANES.....	14
3.4.1 New facilities.....	14
3.4.2 Existing Facilities.....	16
3.4.3 Additional access roads.....	16
3.4.4 Access to Fire Department Connections and Fire Hydrants.....	16
3.4.5 Access during construction, alteration or demolition of a building.....	16
3.4.6 General Specifications.....	17
3.4.6.1 Dimensions.....	17
3.4.6.2 Surface.....	18
3.4.6.3 Turning radius	18
3.4.6.4 Dead-ends.....	18
3.4.6.5 Bridges and below-grade structures.....	18
3.4.6.6 Posting of Load Limit Signs.....	19
3.4.6.7 Grade.....	19
3.4.7 Obstruction of access roads.....	19
3.4.7.1 Maintain access roads unobstructed.....	19
3.4.7.2 Removal of Vehicles and Obstructions.....	20
3.4.7.3 Closure of access ways.....	20
3.4.7.4 Removal of Fire Department Access Road.....	20
3.4.8 Marking of Fire Lanes.....	21

3.4.8.1 General.....	21
3.4.8.2 When required.....	21
3.4.8.3 Removal, Alteration, Defacing of Signs Unlawful.....	21
3.4.8.4 Signs.....	21
SECTION 3.5 --- APPROVAL OF FIRE LANES	22
3.5.1 Permit required.....	22
3.5.2 Procedures for obtaining approvals.	22
APPENDICES.....	24
SECTION 3.6---APPENDIX A ---.....	24
GUIDE FOR FIRE LANE APPROVAL	24
3.6.1 Code Official Approval Permit.....	24
3.6.2. Property Plot Plans Required.....	24
3.6.2.1 Submit Plot Plans.....	24
3.6.2.2 Marking of Plot Plans.....	25
3.6.3 Fire Lane Specifications.....	26
3.6.4 Fire Lane - Tow-Away Zone signs.....	28
3.6.5 Placement of Fire Lane signs.....	29
3.6.5.1 Placement Height.....	29
3.6.5.2 Angle of Attachment.....	29
3.6.5.3 Placement location.....	29
3.6.5.3.2 Minimum number of signs.....	29
3.6.5.3.3 Intermediate signs.....	30
3.6.5.3.4 Parking rows.....	30
3.6.5.3.5 Fire hydrants and Fire Department Connections.....	30
3.6.5.3.6 Marking of curbs.....	30
3.6.5.3.7 Excluded areas.....	31
3.6.5.3.8 Removal of unapproved signs.....	31
3.6.5.4 On Site Review of Fire Lanes.....	32
3.6.5.5 Approved Plot Plans.....	32
SECTION 3.7--- APPENDIX B	34
Fire Lane and Tow-Away Zone Sign Requirements	34
3.7.1 Fire Department Access Road (Fire Lane) Signs.....	34
3.7.2 Tow-Away Zone Signs.....	34
3.7.3 Combining of signs.....	34
3.7.4 Construction of signs.....	34
3.7.5 Positioning of signs.....	34
SECTION 3.8--- APPENDIX C	43
REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS	43
3.8.1 Dead-Ends.....	43
3.8.2 Approved turnarounds.....	44
3.8.3 Clearance around a fire hydrant or fire department connections.....	45
REFERENCES	46

LIFE SAFETY BUREAU (LSB) STANDARD 03, Rev 03

FIRE DEPARTMENT ACCESS

SECTION 3.1 --- GENERAL

3.1.1 Scope.

This standard provides a method of providing for and maintaining adequate and unobstructed emergency access for fire department apparatus and personnel to buildings, structures, hazardous occupancies or other premises, as may be required by the Fire Marshal, the Chief of the Houston Fire Department and the City of Houston *Fire Code*.

3.1.2 Purpose.

The purpose shall be to provide clarification of requirements and guidance to person(s) charged with providing and maintaining required fire department access to premises in compliance with the *Fire Code*. The provisions of this standard are general in nature and are not intended to override the specific requirements of City of Houston *Code of Ordinances* or the *Fire Code*.

This standard is subject to periodic review and updates, to accommodate changes in local need or requirements, changes in nationally recognized standards, in related technology, or where required by state or federal regulations.

SECTION 3.2 --- DEFINITIONS

3.2.1 Access Control Gate or Barrier.

Any gate or barrier placed across a fire apparatus access road to restrict other vehicles or use. Access control gates and barriers shall be installed in accordance with LSB Standard 04, "Access Control Gates".

3.2.2 Cul-de-sac.

Street with only one outlet that terminates in a vehicular turnaround appropriate for the safe and convenient reversal of traffic movement.

3.2.3 Dead Ends.

Street with only one outlet that terminates without a vehicular turnaround provided.

3.2.4 Fire Apparatus Access Road.

A designated road or lane provided so that fire department apparatus can approach or obtain entrance to a building, structure or other property in event of a fire or other emergency situation.

3.2.5 Fire Lane.

An access road so marked as to clearly indicate the required lane of unobstructed fire department access to a building, structure or other property in event of a fire or other emergency situation.

3.2.6 Private Drive.

A private drive is a privately owned way used for vehicular travel that is not a street or private street and that provides an unobstructed connection between one or more streets or private streets or to any portion of a parking lot, shopping center, institution, commercial area or industrial development.

A private drive may provide for access by the general public, but the owner of the private drive maintains the right to restrict public access to the private drive.

3.2.7 Private Street or road.

A private street or road is a privately maintained and owned vehicular access ways that provides access from a public street.

3.2.8 Public Street.

A public right-of-way, however designated, dedicated or acquired, that provides access to adjacent property.

SECTION 3.3 --- GENERAL REQUIREMENTS

3.3.1 Where Required.

Fire Lane applications shall be submitted when it is required by the Code Official that the owner or manager of a commercial building or buildings provide approved Fire Lanes due to vehicular parking or other obstructions that may restrict access to building entrances or exits, and where the following conditions and occupancies are found:

- 1) Any private drive or private street along side of or leading to a commercial structure that is over 300 feet long on one side or if the nearest entrance to the structure is over 150 feet of travel distance from a public street.
- 2) Any private drive or private street along side of or leading to a hospital, convalescent center, or nursing home.
- 3) Any private drive or private street along side of or leading to public assembly occupancy that has an occupancy load of 50 or more and has its nearest entrance located over 150 feet of travel distance from a public street.
- 4) Any private drive or private street along side of or leading to an educational building with an occupancy load of 50 or more persons.
- 5) Any building with a private drive or private street along side of it, where there is an area that must be kept free of parked cars or other obstruction to provide fire department access.

3.3.2 Permits required.

A 'Code Official Approval' permit is required to install a fire department access road or fire lane. A permit is required to install and maintain a fire apparatus access-control gate on a fire apparatus access road, or a private drive or private street utilized for fire apparatus access. A permit is also required to install or maintain a Key Box or Fire Depository Box.

3.3.3 Plans.

3.3.3.1 Plans for access roads and control gates.

Plans for fire apparatus access roads and access control gates shall be submitted to the fire department for review and approval prior to construction.

3.3.3.2 Plans for private fire hydrant systems.

Plans and specifications for private fire hydrant systems shall be submitted to the fire department for review and approval prior to construction.

3.3.3.3 Timing of installation.

When fire protection, including fire apparatus access roads and water systems for fire protection, is required, such protection shall be installed and made serviceable prior to and during construction.

3.3.3.4 Access to building openings.

Required access to building openings shall be in accordance with the *Fire Code* and the *Construction Code*.

For Key Boxes refer to the *Fire Code* and LSB Standard 05, "Key Boxes". For Fire Depository Boxes refer to LSB Standard 06, "Fire Depository Boxes".

3.3.3.5 High Piled Storage Facilities.

Access to high-piled combustible storage facilities shall be in accordance with high-piled storage provisions of the *Fire Code*.

3.3.4 Required Marking of Fire Apparatus Access Roads, Fire Lanes, Addresses and Fire-Protection Equipment.

3.3.4.1 General.

Marking of building or facility addresses and fire-protection equipment shall be in accordance with *Fire Code*. Marking of Fire Lanes shall be in accordance with the *Fire Code* and this standard.

3.3.4.2 Signs and Notices.

When required by the Code Official approved signs or other approved notices shall be provided by the property owner(s) or owner's agent and maintained for fire apparatus access roads and lanes to identify such roads and prohibit obstruction thereof or both, in accordance with this standard.

3.3.4.3 Marking of fire-protection equipment and fire hydrants.

Fire protection equipment and fire hydrants shall be clearly identified in an approved manner to prevent obstruction by parking and other obstructions.

Fire hydrant locations shall be identified by installation of reflective markers in accordance with LSB Standard 09, "Marking of Fire Hydrant Locations".

3.3.4.4 Removal of required signs, gates or barriers.

Locks, gates, doors, barricades, chains, signs, tags or seals which have been installed by the fire department or by its order or under its control shall not be removed, unlocked destroyed, tampered with or otherwise molested in any manner.

SECTION 3.4 --- FIRE APPARATUS ACCESS ROADS AND FIRE LANES

3.4.1 New facilities.

Fire apparatus access roads shall be provided by the owner or property manager for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction of the City of Houston, when any portion of an exterior wall of the first story of the building is located more than 150 feet from fire apparatus access as measured by an approved route around the exterior of the building or facility or where required by Section 3.1 of this standard.

EXCEPTIONS:

1. In buildings that are completely protected with an approved automatic fire sprinkler system, requirements may be modified by the Code Official.
2. When access roads cannot be installed due to location on property, topography, waterways, nonnegotiable grades or other similar conditions, the Code Official is authorized to require additional fire protection measures.
3. Group R-2 Occupancies when in accordance with Chap 42, *Code of Ordinances*.

4. When there are not more than two Group R-3 (Residential), or Group U (Utility) Occupancies, the requirements may be modified by the Code Official.
5. Open Parking Garages (Group S-2 occupancies).

3.4.2 Existing Facilities.

In existing buildings and facilities, the Code Official may require the establishment of fire apparatus access roads or fire lanes in accordance with this standard.

3.4.3 Additional access roads.

Where it is determined by the Code Official that access by a single road might be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access, more than one fire apparatus access road shall be provided.

3.4.4 Access to Fire Department Connections and Fire Hydrants.

Fire department connections and fire hydrants shall be accessible to fire department apparatus by roads or lanes meeting the requirements of Section 4.6.

3.4.5 Access during construction, alteration or demolition of a building.

Fire department access roads shall be established and maintained in accordance with this Standard during construction, alterations or demolition to a building.

3.4.6 General Specifications.

3.4.6.1 Dimensions.

Fire apparatus access roads and Fire Lanes shall have an unobstructed width of not less than 20 feet and an unobstructed vertical clearance of not less than 14 feet.

EXCEPTIONS:

1. Vertical clearance may be reduced; provided such reduction does not impair access by fire apparatus and approved signs are installed and maintained indicating the established vertical clearance when approved.
2. For buildings in existence on or before June 15, 1976, access roads may have an unobstructed width of not less than 15 feet, when the designation of a greater width would necessitate structural changes to the building.
3. Vertical clearances or widths shall be increased when, in the opinion of the Code Official, vertical clearances or widths are not adequate to provide fire apparatus access.

3.4.6.2 Surface.

Fire apparatus access roads shall be designed and constructed to support the minimum imposed load by fire apparatus of 90,000 pounds, and shall be provided with a surface so as to permit all-weather driving capabilities.

3.4.6.3 Turning radius

The turning radius of a fire apparatus access road shall be as approved.

3.4.6.4 Dead-ends.

Dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus.

3.4.6.5 Bridges and below-grade structures.

Where fire apparatus transit must cross over a bridge or below-grade structure as part of a fire apparatus access road or fire lane, the bridge or below-grade structure shall be designed and constructed in accordance with nationally recognized standards. The bridge or below-grade structure shall be designed for a live load sufficient to carry the imposed loads of fire apparatus of 90,000 pounds.

3.4.6.6 Posting of Load Limit Signs.

Vehicle load limit signs shall be posted by the property owner at both entrances to bridges or road accesses over a below-grade structure as required by the Code Official. Load limit signs shall be posted in conspicuous locations and shall be readily readable.

3.4.6.7 Grade.

The slope or grade for a fire apparatus access road shall not exceed the maximum approved.

3.4.7 Obstruction of access roads.

3.4.7.1 Maintain access roads unobstructed.

The required width of a fire apparatus access road, private drive, private street or private access easement utilized for fire apparatus access, shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances established under Section 4.6 shall be maintained at all times.

EXCEPTION: Access control gates/barriers installed in accordance with LSB Standard 04, "Access Control Gates".

Entrances to roads, trails or other access ways which have been closed with gates/ barriers in accordance with this standard, or LSB Standard 04, shall not be obstructed by parked vehicles or other obstructions.

3.4.7.2 Removal of Vehicles and Obstructions.

Fire department access roads and Fire Lanes are tow-away zones, thereby vehicles parked and obstructions placed in violation of the *Fire Code* may be issued citations and may be removed, at the vehicle owner's expense, by or at the direction of the Code Official, fire department incident commander, any peace officer or the property owner in accordance with applicable provisions of the city code and state law.

Entrances to roads, trails or other access ways, which have been closed with gates/barriers in accordance with this standard or LSB Standard 04, shall not be obstructed by parked vehicles.

3.4.7.3 Closure of access ways.

The closure of access ways where required by the Code Official, shall be in accordance with *Fire Code*.

3.4.7.4 Removal of Fire Department Access Road.

A fire department access road or fire lane shall not be altered, modified, removed or placed out of service without prior written approval from the Code Official.

3.4.8 Marking of Fire Lanes.

3.4.8.1 General.

Marking of Fire Lanes shall be in accordance with this standard.

3.4.8.2 When required.

When required by the Code Official, approved signs or other approved notices shall be provided and maintained so as to identify such roads as Fire Lanes and tow-away zones and prohibit the obstruction thereof or both.

3.4.8.3 Removal, Alteration, Defacing of Signs Unlawful.

A person commits an offense, if the person intentionally alters, defaces, injures, knocks down, removes or attempts to do so, any sign required under terms of this standard or the *Fire Code*.

3.4.8.4 Signs.

Fire Lane signs and accompanying Tow-Away Zone signs shall be in accordance with the guidelines set forth in Appendix B.

Premises with an existing approved Fire Lane marked with approved signs may retain these signs until such time as the signs need to be replaced due to weathering, fading, damage or missing. All new or replacement signs shall be in accordance with this standard.

SECTION 3.5 --- APPROVAL OF FIRE LANES

3.5.1 Permit required.

A Code Official Approval permit is required to install any Fire Lane required in accordance with this standard. A "Fire Prevention Permit Application" may be obtained from the fire prevention inspector requiring the Fire Lane, or application may be made at the City of Houston Permit Office, located at 3300 Main Street, telephone: (713) 535-7639.

3.5.2 Procedures for obtaining approvals.

Fire Lane approvals shall be obtained in accordance with procedures set forth in Appendix A of this standard. Approvals shall be obtained prior to any actual installation or marking of a Fire Lane. A 'Code Official Approval' shall be issued at the successful completion of all requirements for an approved Fire Lane as set forth in this standard.

APPENDICES

SECTION 3.6---APPENDIX A --- GUIDE FOR FIRE LANE APPROVAL

3.6.1 Code Official Approval Permit.

An application for a 'Fire Marshal's Approval' permit for a Fire Lane shall be made as required in Section 3.2 of this standard.

3.6.2. Property Plot Plans Required.

3.6.2.1 Submit Plot Plans.

The "Fire Lane" applicant shall submit a "Fire Prevention Permit Application" for approval of a fire lane to the Houston Fire Department Permit Section (See Section 5.2) and three (3) copies of a Plot Plan for the premises. The Plot Plans shall be large enough to provide readily readable detail (preferably of 'Blue Print' size), and shall indicate on the plans the following items:

1. Location of building or buildings
2. Building exits and entrances
3. Street locations
4. Private drives and any gates or barriers to traffic
5. Sidewalks and parking rows
6. Fire Department Connections and fire hydrants on private property
7. Existing fire department access roads, fire lanes and sign locations
8. Any overhead structural extensions or obstructions that could affect Fire Lane placement.
9. All of the above should show size and relative distances from one another.

When plot plans are "designed" by an Architect or Engineer, or when required by the *Construction Code*, the plans shall have appropriate "Seal" affixed.

3.6.2.2 Marking of Plot Plans.

Do not mark any Fire Lane or sign locations on the Plot Plans (with exception of existing lanes and signs). The inspecting fire prevention officer will mark all three sets of plans with **red** ink to indicate where the lanes and signs are required.

The Fire Lane signs and accompanying tow-away zone signs shall be placed on the property, by the owner or owner's agent, as indicated on the Plot Plans by the inspector.

3.6.3 Fire Lane Specifications.

1. The minimum width of any Fire Lane shall not be less than 20 feet (unless it is physically impossible) and minimum unobstructed overhead clearance of not less than 14 feet. See Section 4.1 of this standard for exceptions. The access road should lead from a public street to at least one side of the building where an entrance to the building is located.
2. Any access drive or private street leading to a Fire Lane shall be maintained as to allow for fire department apparatus access and may be designated as a Fire Lane.
3. Where there is a Fire Lane along at least one side of an access road and parking of vehicle reduces the width of the road to less than the required 20 feet, then both sides of the road shall be included in a fire lane.

4. Fire apparatus access roads 20 feet to 26 feet wide shall be posted on both sides as a Fire Lane.
5. Fire apparatus access roads more than 26 feet wide to 32 feet wide shall be posted on one side of the road as a Fire Lane.
6. Where a Fire Lane is required along side of a building that is bordered by a continuous sidewalk connecting the exit doors, no less than one Fire Lane shall be provided for each 300 feet of building frontage or fraction thereof. Such Fire Lane where possible, shall be positioned in front of the building's main entrance. In no case should the Fire Lane be less than 30 feet long or extend less than 20 feet perpendicular from the curb or road edge. If the building's side is less than 30 feet in length, then the entire side shall be designated as a Fire Lane.
7. Where the building does not have a continuous sidewalk connecting the exit doors, a Fire Lane may be required around the building linking all the entrances. In no case shall the Fire Lane be less than 20 feet wide, measured perpendicular from the edge of the pavement along side the building where vehicular traffic is allowed.
8. Where there is a danger that a required exit door of any building may be blocked by vehicles parking on a private drive or private street or lot, a Fire Lane extending not less than 5 feet on either side of the exit and 20 feet out from the building may be required to allow egress from the building in an emergency.
9. In the occupancies where Fire Lanes are required and the building(s) face more than one private street or private drive, at least one Fire Lane 30 feet long shall be provided on each side and as near as possible to the building entrance.

3.6.4 Fire Lane - Tow-Away Zone signs.

An approved Tow-Away Zone sign shall accompany all Fire Lane signs. Specifications for both signs shall be as set forth in Appendix B of this Standard. Signs may be combined as one sign provided each of the requirements of the individual signs are met.

3.6.5 Placement of Fire Lane signs.

3.6.5.1 Placement Height.

Fire Lane signs shall be placed no lower than 6 feet and no higher than 7 feet above the ground, as measured from the bottom edge of the access road sign.

3.6.5.2 Angle of Attachment.

Fire Lane -Tow-Away Zone signs shall be placed on a post or column at a 20-degree angle from the parallel to the driveway area so that they face oncoming traffic.

3.6.5.3 Placement location.

3.6.5.3.1 Maximum distance.

Fire Lane -Tow-Away Zone signs shall not be located more than 100 feet apart.

3.6.5.3.2 Minimum number of signs.

No less than two Fire Lane -Tow-Away Zone signs, with arrows pointing toward each other, shall be used to indicate the limits of any Fire Lanes on any one side of a building or access road.

3.6.5.3.3 Intermediate signs.

Intermediate Fire Lane - Tow-Away Zone signs shall be provided for fire department access roads over 100 feet long and for every 100 feet or fraction thereof. These signs shall have arrows pointing in both directions. (See Enclosure No. 3)

3.6.5.3.4 Parking rows.

Fire Lane - Tow-Away Zone signs, pavement striping or painted wheel stops shall also be placed at the end of any parking rows that extend into the or within 5 feet of an approved access road.

3.6.5.3.5 Fire hydrants and Fire Department Connections.

Where required by the Code Official, fire hydrants and fire department connections, not within a Fire Lane shall be provided with Fire Lane - Tow-Away Zone signs. Such signs shall be not less than 30 feet apart.

3.6.5.3.6 Marking of curbs.

Curbs located between approved Fire Lane - Tow-Away Zone signs shall be painted RED or a RED stripe shall be placed along the pavement where there is no curb. These curbs shall also be conspicuously and legibly marked with the warning "**FIRE LANE - TOW AWAY ZONE**" in WHITE letters at least three (3) inches in height, at intervals not exceeding fifty (50) feet.

Any color other than red may be used in "**NO PARKING**" areas that are not approved Fire Lanes. RED colored curbs, pavement striping or wheel stops shall be used only to designated approved Fire Lanes except where authorized by the Code Official.

3.6.5.3.7 Excluded areas.

"Loading Zones", "Package Pick-up", "Patient Drop-off" or other such areas that invite illegal parking in Fire Lanes shall not be included in the fire lane boundaries. Such areas shall be excluded from the Fire Lane with Fire Lane - Tow-Away Zone signs pointing away from that area.

Any "No Parking" or other signs erected that are not approved Fire Lane - Tow-Away Zone signs may be in any color but RED.

3.6.5.3.8 Removal of unapproved signs.

Any unapproved fire lane signs or markings shall be removed.

3.6.5.4 On Site Review of Fire Lanes.

The inspecting fire prevention officer should meet on site with property representative to deliver and review a copy of marked Plot Plans. The inspector should provide the property representative with a properly marked copy of the Plot plans. The inspector shall review the site with the property representative and indicate to the property representative the actual limits and locations for the Fire Lane - Tow-Away Zone, and access road signs according to inspector's pre-marked copies of the Plot Plans.

The inspector then will establish a re-inspection time frame or date to check the completed work prior to giving final approval to property's Fire Lanes.

3.6.5.5 Approved Plot Plans.

After the inspecting officer completes an on-site final approval of the Fire Lanes and access road signs, the property representative shall be provided with a copy of the final approved Plot

Plans, indicating the approved access roads, signs and markings, and be issued the 'Code Official Approval' permit for the site.

A copy of the final approved Plot Plans should be forwarded by the inspector to the Code Official's office, to be added to an approved up-dated "Code Official's Official Fire Lane List". The Code Official's office shall forward an updated copy of the approved fire lane list to the City of Houston Municipal Courts. The remaining copy of the approved Plot plans should be kept on file with the inspector's inspection files.

SECTION 3.7--- APPENDIX B

Fire Lane and Tow-Away Zone Sign Requirements

3.7.1 Fire Department Access Road (Fire Lane) Signs.

Fire Lane signs shall be in accordance with Enclosure No.1 of this appendix.

3.7.2 Tow-Away Zone Signs.

Tow-Away Zone signs shall be provided along with all approved Fire Lane signs, and shall in accordance with Enclosure No. 2 of this appendix.

3.7.3 Combining of signs.

Signs may be combined as one sign provided the requirements for the individual signs are met.

3.7.4 Construction of signs.

Signs shall be constructed of durable, weather resistive materials and paints.

3.7.5 Positioning of signs.

Where Fire Lane signs are required, an approved Tow-Away Zone sign shall be attached to the same pole or column, immediately below and at the same angle of attachment as the Fire Lane sign.

Height of the signs shall be not less than 6 feet or more than 7 feet above the ground, as measured from the bottom edge of the lower sign.

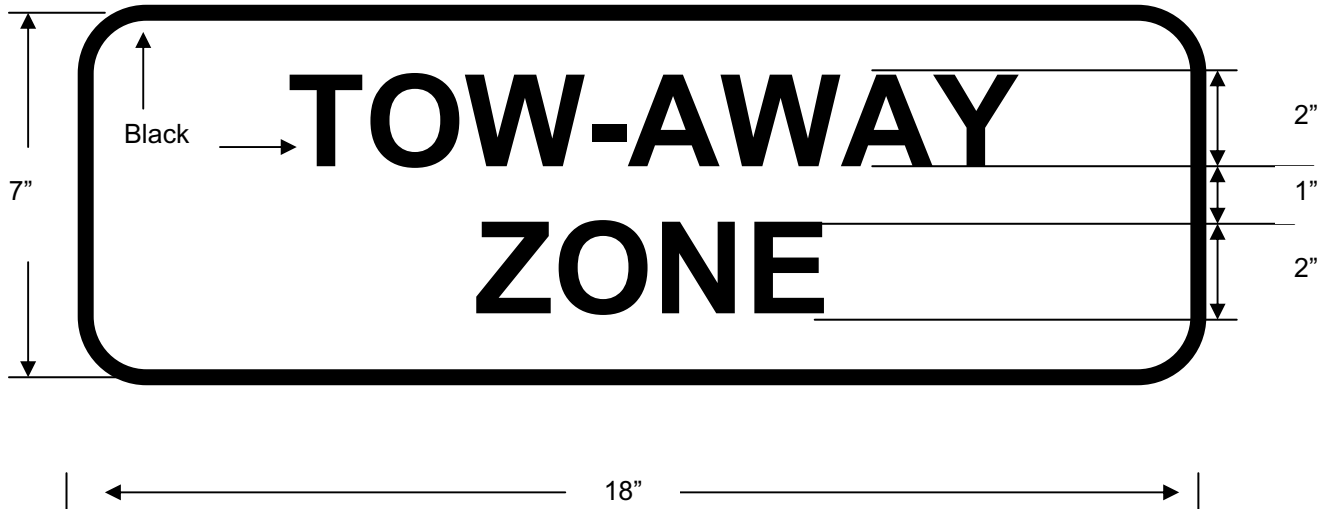
Technical drawing of a Fire Lane sign. The sign is rectangular with rounded corners, featuring a red border and a white background. It is divided into three horizontal sections. The top section contains a red circle with a diagonal slash and a black 'P' inside, indicating a no parking zone. The middle section is a red horizontal band with the text 'FIRE LANE' in white, bold, sans-serif capital letters. The bottom section is a white horizontal band with a red double-headed arrow pointing left and right. Dimensions are provided in inches: the overall height is 24", the overall width is 18", the top section is 10" high, the middle section is 3" high, and the bottom section is 8" high. The red circle has a diameter of 10". The red band is 1" thick. The white band is 4" high. The red double-headed arrow is 2 1/4" high. Labels indicate 'Red' for the circle and band, 'Black' for the 'P', and 'White Background' for the sign's background and the bottom section.

LSB STANDARD 03, Rev 03 05-05-08 - FIRE DEPARTMENT ACCESS

SPECIFICATIONS:

1. Size of sign: Standard - 18 inches in width, 24 inches in height
2. Colors: White - Outer border, background and **FIRE LANE** letters
Red - Inner border, Prohibitive Symbol, and Arrow
Black - Letter 'P'
3. Letter sizes: 'P' - 6 inches
FIRE LANE - 2 inches
4. Prohibitive symbol: 10-inch o.d.
5. Background for FIRE LANE: 3 inches in height
6. Arrow: Head: 2¼ inches in height
Shaft: 1 inch in width, 14 inches in length

Enclosure 2 – TOW-AWAY SIGNS



SPECIFICATIONS:

1. Size: 18 inches in width
7 inches in height
2. Colors: White - Outer border and background
Black - Inner border and **TOW-AWAY ZONE**
3. Letters: 2 inches in height

Note: Drawing NOT to scale. All graphics and lettering shall be center justified. Use "Arial" font.

Enclosure 3 - Plotting Fire Lane Signs

The direction the fire lane signs are to point and the distance apart shall be shown on the Plot plan in the following manner:



(Examples are not drawn to scale)

SECTION 3.8--- APPENDIX C

REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS

3.8.1 Dead-Ends.

Dead-end fire apparatus access roads in excess of 150 feet shall be provided with width and turnaround provisions in accordance with Table C-1 of this appendix.

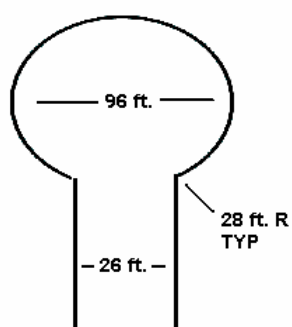
Table C-1 Requirements for dead-end fire apparatus access roads

Length (feet)	Minimum Width (feet)	Turnarounds required
0 -- 150	20	None required
150 -- 500	20	120 ft Hammerhead, 60 ft "Y", or 96 ft diameter cul-de-sac
500 -- 750	26	120 ft Hammerhead, 60 ft "Y", or 96 ft diameter cul-de-sac
Over 750	Special approval required	

3.8.2 Approved turnarounds.

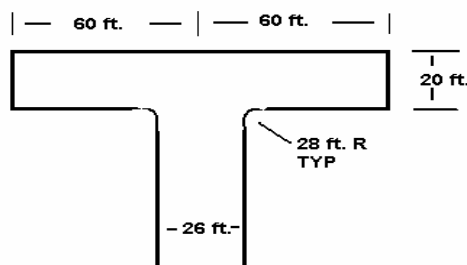
The following figures show approved methods of providing required turnarounds:

Figure No. 1



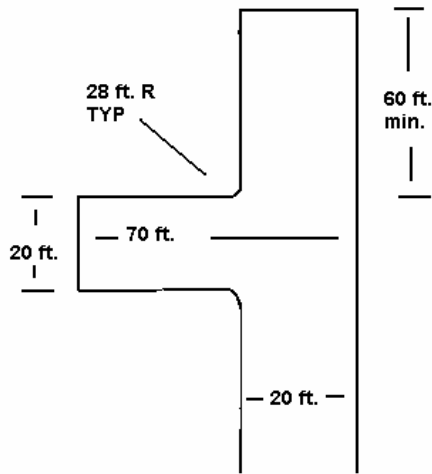
**96 ft. DIAMETER
CUL-DE-SAC**

Figure No. 2



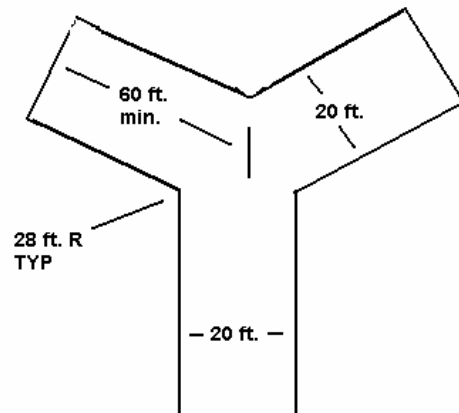
120 ft. HAMMERHEAD

Figure No. 3



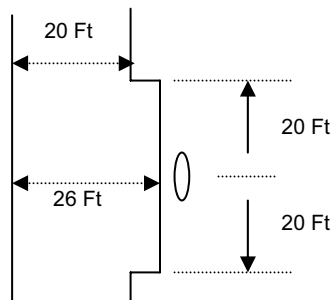
**ACCEPTABLE
ALTERNATIVE TO
120 ft. HAMMERHEAD**

Figure No. 4



**ACCEPTABLE
ALTERNATIVE TO
120 ft. HAMMERHEAD**

3.8.3 Clearance around a fire hydrant or fire department connections.



**MINIMUM CLEARANCE
AROUND A FIRE HYDRANT OR FIRE
DEPARTMENT CONNECTIONS (FDC)**

REFERENCES

1. City of Houston *Fire Code*, International Fire Code, 2000 edition, as amended.
2. City of Houston *Building Codes*, all editions.
3. City of Houston *Code of Ordinances*, Section 42.
4. Texas Manual on Uniform Traffic Control Devices (State Department of Highways and Public Transportation).
5. Texas Traffic Laws - Transportation Code, Subchapter B. UNAUTHORIZED VEHICLES §684.011 and §684.012.

Conversion factors: 1 inch = 25 mm; 1 foot = 305 mm